

09/986,446

Attorney Docket No.: 20496/365

REMARKS

Entry of this Amendment is respectfully requested. The present Amendment does not raise any new issues for examination in that the limitations of claim 13 have been incorporated into claims 12 and 24. (Minor formal amendments have also been made to claim 24 for the sake of clarity.) Furthermore, it is believed that upon entry of this Amendment, the application will be placed in condition for allowance or, in any event, reduce the issues for appeal. Accordingly, entry of this Amendment is respectfully requested.

In the final Office Action dated May 14, 2004, the Examiner rejected the claims under 35 U.S.C. 103(a) as being unpatentable over JP 07-207,357 (JP '357) in view of US 4,790,873 (US '873) and, for some of the claims, further in view of US 4,113,241 (US '241). However, for the reasons set forth below, it is believed that the claims, as amended herein, are patentable over this art. In particular, it would not be obvious to a person skilled in the art to combine teachings of JP '357 with those of US '873 to arrive at the claimed invention.

According to amended claims 12 and 24, a cake filter is used as first filter. Furthermore, the first filter, that is the cake filter, is specifically arranged before the grain refining material feed. This choice and arrangement of the first filter has the advantage that the efficiency of the filter is much higher compared to an arrangement in which the filter is arranged behind the grain refining material feed, because otherwise the grain refining material would hamper or disable the building of the necessary impurity

09/986,446

Attorney Docket No.: 20496/365

accumulations of the filter. Therefore, an improvement in the efficiency of the filter device is provided by a special and very effective arrangement of the first filter, that is an arrangement where the first filter is a cake filter and is located before the grain refining material feed.

Furthermore, the second filter is a deep-bed filter, wherein a deep-bed filter is inherently a very effective filter and this is not taught by JP '357.

The use of a deep-bed filter as the second filter is also inventive in view of the teachings of US '873, because US '873 describes a totally different arrangement. According to US '873, a metal melt is filtered by a first and a second filter, the melt comprising even before entering the first filter both metal-non-wettable and metal-wettable inclusions. The metal-wettable inclusions are impurities that come from feeding grain refining materials to the metal melt. However, according to the presently claimed invention, especially these impurities or inclusions should not reach the first filter, because this would reduce the efficiency of the first filter. Furthermore, according to the present invention all other impurities or inclusions including the metal-non-wettable inclusions should not reach the second filter, but should already be removed from the melt by the first filter. In contrast thereto, US '873 teaches that even before the first filter, there exist metal-wettable inclusions in the metal melt and therefore these metal-wettable inclusions will reach the first filter and that all inclusions or impurities, that is metal-wettable and metal-non-wettable inclusions, are filtered by the second filter.

09/986,446

Attorney Docket No.: 20496/365

Therefore, a person skilled in the art would not modify JP '357 in view of US '873 because of the totally different arrangement of the filters described in US '873.

Furthermore, the use of a deep-bed filter as second filter is inventive because US '873 describes an arrangement according to which before the deep-bed filter there is stringently arranged a filter which creates salt droplets, which salt droplets embed the metal-non-wettable inclusions. These salt droplets are then directed to the second filter, that is the deep-bed filter, which filter according to US '873 on the one hand removes the salt droplets from the melt, and on the other hand removes the metal-wettable inclusions which appear from feeding grain refining material. In other words, US '873 teaches that the deep-bed filter can only remove metal-wettable inclusions in an effective way when at the same time salt droplets accumulate on the surface of the filter, which salt droplets have to be created by a first filter arranged before the deep-bed filter. But according to the presently claimed invention, the first filter is a cake filter which does not create salt droplets. Therefore, according to the teachings of US '873, a person skilled in the art would come to the conclusion that a deep-bed filter in the present case is not adequate for filtering the impurities in the metal melt applied by the grain refining material feed.

Finally, US '873 teaches that the second filter usually clogs very fast. That's why according to US '873 only cheap plate-filters are used as second filters. In fact, according to the present invention, the second filter does not clog very fast, because only marginal impurities or inclusions have to be removed by this filter which impurities come

09/986,446

Attorney Docket No.: 20496/365

from feeding grain refining material. The other impurities have already been removed by the first filter in the form of a cake filter.


As a result, a device for filtering and adding a grain-refining material to a metal melt with the features of amended claims 12 and 24 is not only new, but also inventive.

For the foregoing reasons, it is believed that the application is now in condition for allowance and a favorable action on the merits is respectfully requested.

Respectfully submitted,

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